Designation: C 1036 – 01

Standard Specification for Flat Glass [1]

This standard is issued under the fixed designation C 1036; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers the requirements for annealed, monolithic flat glass of rectangular shape supplied as cut sizes or stock sheets. This specification is applicable for laboratory and field evaluation only to the extent that such evaluation can be carried out in accordance with the test method(s) prescribed herein.

1.2 This specification covers the quality requirements of flat, transparent, clear and tinted glass having glossy, apparently plane and smooth surfaces. The glass is intended to be used primarily for mirrors, coatings, glazing, and general architectural or similar uses.

NOTE 1—Reflective distortion is not addressed in this specification.

NOTE 2—There may be blemishes or other glass quality requirements that are not addressed in this specification.

1.3 This specification covers the quality requirements of patterned or wired glasses intended to be used primarily for decorative and general glazing applications.

1.4 The dimensional values stated in metric units are to be regarded as the standard. The inch-pound units given in parentheses are for information only.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

C 162 Terminology of Glass and Glass Products[2,3]

2.2 *Other Standards:*

NFRC 300 Procedure for Determining the Solar Optical Properties for Simple Fenestration Products[4]

3. Terminology

3.1 For additional definitions of terms, Refer to Terminology C 162.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *bevel*—an angled surface at the edge of a lite of glass.

3.2.2 *blemish* —an imperfection in the body or on the surface of the glass. For the purpose of this specification blemishes are divided into three categories:

3.2.2.1 *crush blemish*—a lightly pitted condition with a dull gray appearance.

3.2.2.2 *linear blemish*—Scratches, rubs, digs, and other similar imperfections.

3.2.2.3 *point blemish*—knots, dirt, stones, gaseous inclusions and other similar imperfections

3.2.3 *chip depth*—the measured distance of a chip from the face of the glass into the thickness.

3.2.4 *chip length* —the distance parallel to the edge of the glass from one edge of a chip to the other.

3.2.5 *chip width*—the perpendicular distance from the edge of the glass to the inner edge of the chip.

3.2.6 *cut sizes*—glass ordered cut to its final intended size.

3.2.7 *digs*—deep, short scratches.

3.2.8 *dirt*—a small particle of foreign matter embedded in the surface of a flat glass sheet.

3.2.9 *fire cracks*—small, sometimes microscopic fissures in the edge of wired or patterned glass.

3.2.10 *flare*—a protrusion on the glass edge or corner of an otherwise rectangular surface.

3.2.11 *gaseous inclusion*—a round or elongated bubble in the glass.

3.2.12 *knot*—an inhomogeneity in the form of a vitreous lump.

3.2.13 *lines*—fine cords or strings, usually on the surface of sheet glass.

3.2.14 *patterned glass*—rolled flat glass having a pattern on one or both surfaces.

3.2.15 *ream*—a linear distortion due to non-homogeneous layers of flat glass.

3.2.16 *rub*—abrasion of a glass surface producing a frosted appearance.

3.2.17 *scratch*—damage on a glass surface in the form of a line caused by the relative movement of an object across and in contact with the glass surface.

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[1] This specification is under the jurisdiction of ASTM Committee C14 on Glass and Glass Products and is the direct responsibility of Subcommittee C14.08 on Flat Glass.

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[2] Latest issue, unless otherwise specified by the agency applying Specification C 1036.

[3] *Annual Book of ASTM Standards*, Vol 15.02.

[4] National Fenestration Rating Council, 1300 Spring Street, Suite 500, Silver Spring, MO 20910.

3.2.18 *shell chip*—a circular indentation in the glass edge due to breakage of a small fragment out of an otherwise regular surface.

3.2.19 *stock sheets*—glass ordered in sizes intended to be cut to create final or cut size (that is, uncuts, intermediates, jumbos, lehr ends).

3.2.20 *stone*—a crystalline inclusion in glass.

3.2.21 *string*—a straight or curled line, usually resulting from slow solution of a large grain of sand or foreign material.

3.2.22 *tinted glass*—glass formulated to give light or heat or both, reducing capability and color.

3.2.23 *v-chip*—a v-shaped imperfection in the edge of the glass lite.

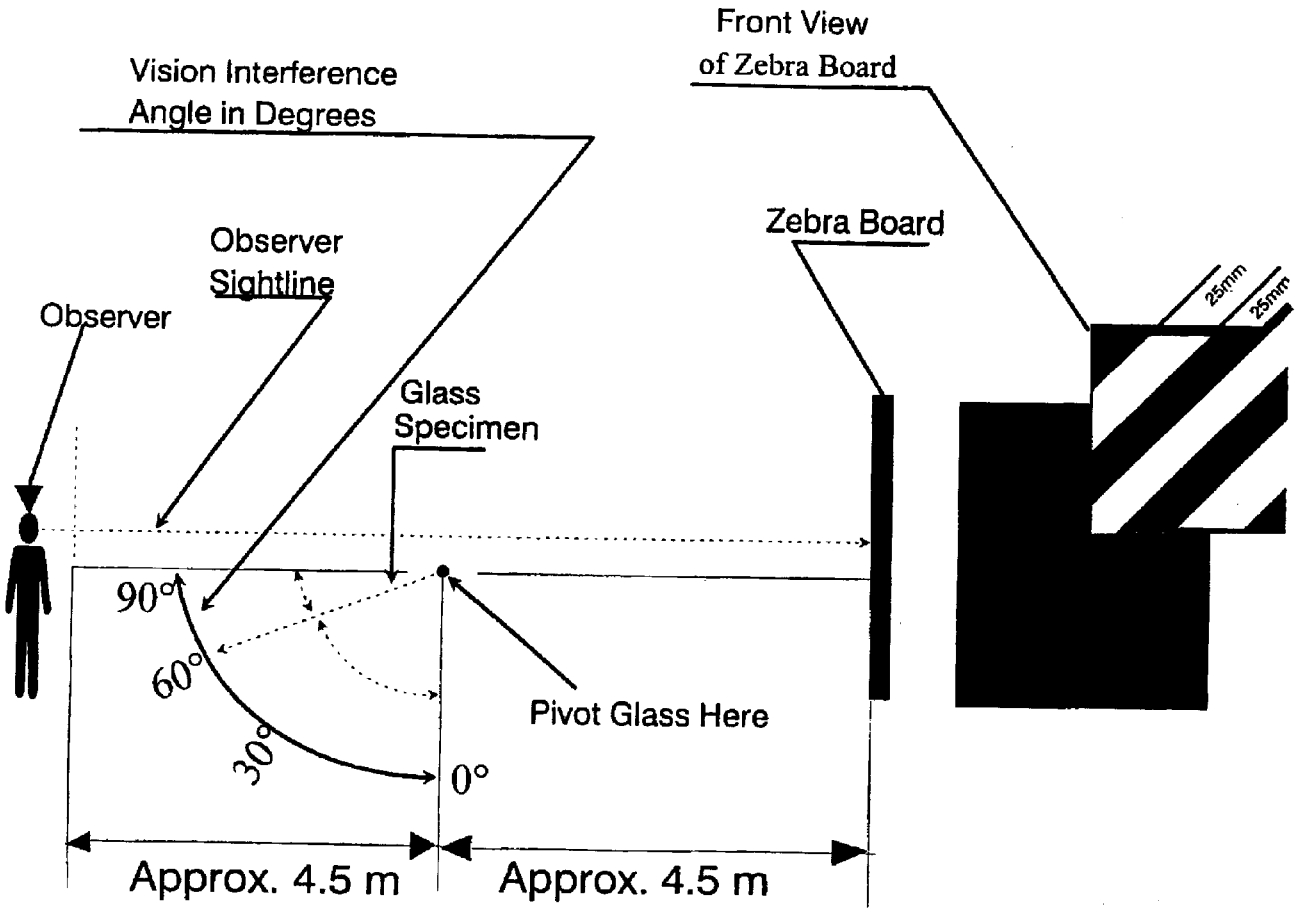

FIG. 1 Vision Interference Angle

3.2.24 *vision interference angle*—the angle at which distortion in transmission first appears (See Fig. 1)

3.2.25 *wired glass*—flat glass with a layer of wire mesh embedded in the glass.

4. Classification and Intended Use

NOTE 3—When referencing this specification, the user shall indicate the title and date of the specification and the type, class quality (including cut-size or stock sheets), size and thickness of the glass.

4.1 *Types, Classes, Forms, Qualities, and Finishes*—Glass shall be of the following types, classes, forms, qualities, and finishes, as specified (see below):

4.1.1 *Type I—Transparent Flat Glass:*

4.1.1.1 *Class 1—Clear:*

Quality	Intended Use
Quality-Q1 (cut-size or stock sheets)	Recommended or intended, or both, for use in the production of high quality mirrors.
Quality-Q2 (cut-size or stock sheets)	Recommended or intended, or both, for use in the production of general use mirrors and other applications.
Quality-Q3 (cut-size or stock sheets)	Recommended or intended, or both, for architectural applications including reflective and low emissivity coated glass products, and other select glazing applications.
Quality-Q4 (cut-size or stock sheets)	Recommended or intended, or both, for general glazing applications.

4.1.1.2 *Class 2 Tinted:*

Quality	Intended Use
Quality-Q1	Not available
Quality-Q2 (cut-size or stock sheets)	Recommended or intended, or both, for use in the production of general use mirrors and other applications.
Quality-Q3 (cut-size or stock sheets)	Recommended or intended, or both, for architectural applications including reflective and low emissivity coated glass products, and other select glazing applications.
Quality-Q4 (cut-size or stock sheets)	Recommended or intended, or both, for general glazing applications.

4.1.2 *Type II—Patterned and Wired Flat Glass:*
Class 1 - Clear
Class 2 - Tinted:

Quality	Intended Use
Quality-Q5	Intended for use where design and aesthetic characteristics are major considerations.
Quality-Q6	Intended for general glazing where functional characteristics are a consideration and where blemishes are not a major concern.

Form	Description
Form 1	Wired Glass, polished both sides
Form 2	Wired Glass, patterned surfaces
Form 3	Patterned Glass

Finish	Description
Finish 1 (F1)	Patterned one side
Finish 2 (F2)	Patterned both sides

Mesh	Description
Mesh 1 (M1)	Diamond
Mesh 2 (M2)	Square
Mesh 3 (M3)	Parallel strand
Mesh 4 (M4)	Special

Pattern	Description
Pattern 1 (P1)	Linear
Pattern 2 (P2)	Geometric
Pattern 3 (P3)	Random
Pattern 4 (P4)	Special

5. Requirements

5.1 *Requirements for Type I (Transparent Flat Glass):*

5.1.1 *Edge Requirements*—Edges of glass shall be supplied as specified.

NOTE 4—Edges may be supplied or specified, or both, as factory cut, seamed, ground, polished, beveled, mitered, etc. See manufacturers' literature for more information.

5.1.1.1 *Shell Chips*—Shell chips are permitted. (See Table 6 for acceptance criteria.)

5.1.1.2 *V-Chips*—V-Chips are not permitted.

5.1.2 *Dimensional Tolerances* —Tolerances for length, width, squareness, and thickness shall be in accordance with Table 1.

5.1.3 *Blemishes* —Allowable blemishes are addressed in Section 6 and in Table 2, Table 3, and Table 4.

5.1.4 *Uniformity*—For cut sizes of glass with a thickness of 6 mm (¼ in.), or less the glass shall not vary in thickness more than 0.1 mm (.004 in.) over a 100 mm (4 in.) area.

5.1.5 *Distortion*—Reams, strings, lines and other allowable distortion (in transmission) are addressed in Section 6 and Table 5.

5.1.6 *Squareness*—The squareness requirements for cut glass are shown in 6.1.8 and in Table 1.

5.2 *Requirements for Type II, (Patterned and Wired Flat Glass)*

5.2.1 *Wired (Forms 1 and 2)*

5.2.1.1 *Form 1 (Polished Both Sides)*—Glass may contain waviness that does not interfere with vision normal to the surface.

5.2.1.2 *Form 2 (Patterned One or Both Sides)*—Glass shall not contain fire cracks.

5.2.1.3 *Dimensional Tolerances*—Tolerance for length,

TABLE 1 Dimensional Tolerance for Rectangular Shapes of Type 1 Transparent, Flat Glass[A]

Thickness		Thickness Range				Cut Size Length and Width[A]		Cut Size Squareness D1–D2		Stock Sheet Tolerance	
Designation mm	Traditional Designation	mm		in.						Length and Width[A]	
		min	max	min	max	± mm	(± in.)	± mm	(± in.)	± mm	(± in.)
1.0	micro-slide	0.79	1.24	0.031	0.049	1.6	(1/16)	2.0	(5/64)	6.4	1/4
1.5	photo	1.27	1.78	0.050	0.070	1.6	(1/16)	2.0	(5/64)	6.4	1/4
2.0	picture	1.80	2.13	0.071	0.084	1.6	(1/16)	2.0	(5/64)	6.4	1/4
2.5	single	2.16	2.57	0.085	0.101	1.6	(1/16)	2.0	(5/64)	6.4	1/4
2.7	lami	2.59	2.90	0.102	0.114	1.6	(1/16)	2.0	(5/64)	6.4	1/4
3.0[B]	double-1/8 in.	2.92	3.40	0.115	0.134	1.6	(1/16)	2.0	(5/64)	6.4	1/4
4.0	5/32 in.	3.78	4.19	0.149	0.165	1.6	(1/16)	2.0	(5/64)	6.4	1/4
5.0	3/16 in.	4.57	5.05	0.180	0.199	1.6	(1/16)	2.0	(5/64)	6.4	1/4
6.0	1/4 in.	5.56	6.20	0.219	0.244	1.6	(1/16)	2.0	(5/64)	6.4	1/4
8.0	5/16 in.	7.42	8.43	0.292	0.332	2.0	(5/64)	2.8	(7/64)	6.4	1/4
10.0	3/8 in.	9.02	10.31	0.355	0.406	2.4	(3/32)	3.4	(1/8)	6.4	1/4
12.0	1/2 in.	11.91	13.49	0.469	0.531	3.2	(1/8)	4.5	(11/64)	6.4	1/4
16.0	5/8 in.	15.09	16.66	0.595	0.656	4.0	(5/32)	5.7	(7/32)	6.4	1/4
19.0	3/4 in.	18.26	19.84	0.719	0.781	4.8	(3/16)	6.8	(1/4)	6.4	1/4
22.0	7/8 in.	21.44	23.01	0.844	0.906	5.6	(7/32)	7.9	(19/64)	6.4	1/4
25.0	1 in.	24.61	26.19	0.969	1.031	6.4	(1/4)	9.0	(11/32)	6.4	1/4

[A]Length and width of cut size and stock sheets of flat glass include flares and bevels.
[B]Within the 3.0 designation there are some applications that may require different thickness ranges (see manufacturer).

width, and thickness shall be in accordance with Table 7.

5.2.1.4 *Wire and Mesh*—Diameter of wires shall be from 0.43 mm to 6.4 mm (0.017 in. to 0.025 in.) Discoloration and slight distortion of wire are permissible. Wired glass may contain numerous gaseous inclusions along the wire.

5.2.1.4.1 Mesh M1, diamond shall be welded. Opening in the mesh shall not exceed 32 mm (1¼in.) between wire intersection measured across diagonal corners of the diamond.

5.2.1.4.2 Mesh M2, square shall be welded. Opening in the mesh shall not exceed 16 mm (⅝in.) between wire intersections measured along a side of the square.

5.2.1.4.3 Mesh M3, parallel strand, spacing shall be as specified.

5.2.1.4.4 Mesh M4, as specified.

5.2.2 *Patterned (Form 3)*:

5.2.2.1 *Dimensional Tolerances*—Finishes F1 and F2, patterns P1, P2, P3, and P4. Tolerances for patterns P1 and P2 for length, width, and thickness shall be in accordance with Table 8. Check with the manufacturer for thickness and dimensional tolerances on Random pattern P3 and Special pattern P4.

5.2.2.2 Patterned glass shall not contain fire cracks.

5.2.2.3 *Surface Pattern*

5.2.2.3.1 Quality Q5—Surface pattern shall be clear, sharp, defined and free of obvious disfiguration that affects the appearance of the pattern.

5.2.2.3.2 Quality Q6—Surface pattern shall be free of large areas of blemishes. Scattered areas of non-uniform surface and scattered surface blemishes are permissible.

NOTE 5—Patterned glass can vary slightly in both configuration and color from run to run.

6. Test Methods

NOTE 6—All visual inspections for blemishes shall be made with 20/20 vision (naked eye or corrected).

6.1 *Test Methods for Type I Glass (Transparent Flat Glass):*

6.1.1 *Ream, Strings, Lines and Distortion*— (See Fig. 1) Place specimen in a vertical position at a distance of approximately 4.5 m (15 ft.) from a zebra board with 25 mm (1 in.) black and white diagonal stripes. The viewer shall look through the sample at a distance of 4.5 m (15 ft.) using daylight (without direct sunlight) or other uniform diffused background lighting that simulates daylight with a minimum illuminant of 160 foot-candles. Start with the glass specimen parallel with the zebra board (identified as zero degrees) and perpendicular with the viewer's line of sight. Rotate the specimen clockwise from zero until it reaches the angle at which the distortion appears and report that angle-referred to as the vision interference angle. Refer to Table 5 for evaluation criteria.

6.1.2 *Blemish Detection for Point Blemish (Knots, Dirts, Stones, Gaseous Inclusions and Other Similar Blemishes)*—Place samples in a vertical position at a distance of approximately 1 m (39 in.) from the viewer. The viewer shall look

TABLE 2 Allowable Point Blemish Size and Distribution For Cut Size Qualities Thickness 6.0 mm (¼ in.) or Less[A]

Blemish size mm (in.)[B,C,D]	Q1 Quality 1	Q2 Quality 2	Q3 Quality 3	Q4 Quality 4
< 0.50 (0.02)	Allowed[E]	Allowed[E]	Allowed	Allowed
≥ 0.50 < 0.80 ≥ (0.02) < (0.03)	Allowed with a minimum separation of 1500 mm (60 in.)[F]	Allowed with a minimum separation of 600 mm (24 in.)[F]	Allowed	Allowed
≥ 0.80 < 1.20 ≥ (0.03) < (0.05)	None allowed	Allowed with a minimum separation of 1200 mm (48 in.)[F]	Allowed	Allowed
≥ 1.20 < 1.50 ≥ (0.05) < (0.06)	None allowed	Allowed with a minimum separation of 1500 mm (60 in.)[F]	Allowed with a minimum separation of 600 mm (24 in.)[F]	Allowed
≥ 1.50 < 2.00 ≥ (0.06) < (0.08)	None allowed	None allowed	Allowed with a minimum separation of 600 mm (24 in.)[F]	Allowed
≥ 2.00 < 2.50 ≥ (0.08) < (0.10)	None allowed	None allowed	None allowed	Allowed with a minimum separation of 600 mm (24 in.)[F]
≥ 2.5 ≥ (0.10)	None allowed	None allowed	None allowed	None allowed

[A]Glass thicker than 6.0 mm (1/4 in.) and less than or equal to 12.0 mm (½ in.) may contain proportionally more and larger blemishes. Table 2 does not apply to glass thicker than 12.0 mm (½in.). Allowable blemishes for glass thicker than 12.0 mm (½ in.) shall be determined by agreement between the buyer and the seller.
[B]See 6.1.2 for detection of point blemishes.
[C]See 6.1.5 for measurement of point blemishes.
[D]For Q1 and Q2 only, the blemish size includes associated distortion (See 6.1.5).
[E]Provided that normally non-detectable blemishes do not form a cluster that is detectable at 1800 mm (6 ft.)
[F]See 6.1.6 for minimum blemish separation.

TABLE 3 Allowable Point Blemish Size and Distribution for Stock Sheet Qualities Thickness 6.0 mm (¼ in.) or Less[A]

Glass Area	Point Blemishes Allowed
If glass area < 7 square meters (75 sf)	One rejectable point blemish allowed
If glass area ≥ 7 square meters (75 sf) but < 14 square meters (150 sf)	Two rejectable point blemishes allowed
If glass area ≥ 14 square meters (150 sf)	Three rejectable point blemishes allowed

[A]Follow the appropriate requirements in Table 2. Note these additional details for Stock Sheet quality requirements (including minimum separation requirements).

through the sample at an angle of 90° (perpendicular) to the surface using daylight, (with out direct sunlight), or other uniform diffused background lighting that simulates daylight, with a minimum illuminate of 160 foot-candles. If a blemish is detected, refer to Tables 2 and 3 for evaluation criteria.

6.1.3 *Point Blemish Measurement*—Point blemish size shall be determined by measuring the length and width of the blemish and calculating the average of the two dimensions. The allowable blemish sizes listed in Table 2 include associated distortion for Q1 and Q2, but Q3 and Q4 do not include associated distortion.

6.1.4 *Blemish Detection for Crush*—Place samples in a vertical position at a distance of approximately 2 m (78 in.) from the viewer. The viewer shall look through the sample at an angle of 90° (perpendicular) to the surface using daylight (without direct sunlight), or other uniform diffused background lighting that simulates daylight, with a minimum illuminate of 160 foot-candles. If a blemish is detected refer to Table 2 and Table 3 for evaluation criteria.

6.1.5 *Detection for Linear Blemishes (Scratches, Rubs, Digs, and Other Similar Blemishes)*—Place samples in a vertical position to the viewer. The viewer shall stand approximately 4 m (160 in.) from specimen and look through the sample at an angle of 90° (perpendicular) to the surface using daylight (without direct sunlight), or other uniform diffused background lighting that simulates daylight, with a minimum illuminate of 160 foot-candles. The viewer shall move towards the specimen until a blemish is detected (if any). The distance from the viewer to glass surface when the blemish is first detectable is defined as the Detection Distance. Blemish intensity is determined by comparing the Detection Distance to the Blemish Intensity Chart at the bottom of Table 4. Blemish Length is determined by measuring the perpendicular distance between the ends of the blemish. Refer to Table 4 for evaluation criteria.

TABLE 4 Allowable Linear Blemish Size and Distribution for Cut Size and Stock Sheet Qualities Thicknesses 6.0 mm (¼in.) or Less[A]

Linear Blemish Size[B] Intensity Length	Q1 Quality 1 Distribution	Q2 Quality 2 Distribution	Q3 Quality 3 Distribution	Q4 Quality 4 Distribution
Faint ≤ 75mm (3 in.)	Allowed with a minimum separation of 1500 mm (60 in.)	Allowed with a minimum separation of 1200 mm (48 in.)	Allowed	Allowed
Faint > 75 mm (3 in.)	None allowed	None allowed	Allowed	Allowed
Light ≤ 75 mm (3 in.)	None allowed	Allowed with a minimum separation of 1200 mm (48 in.)	Allowed	Allowed
Light > 75 mm (3 in.)	None allowed	None allowed	Allowed	Allowed
Medium ≤ 75 mm (3 in.)	None allowed	None allowed	Allowed with a minimum separation of 600 mm (24 in.)	Allowed
Medium > 75 mm (3 in.)	None allowed	None allowed	None allowed	Allowed
Heavy ≤ 150 mm (6 in.)	None allowed	None allowed	None allowed	Allowed with a minimum separation of 600 mm (24 in.)
Heavy >150 mm (6 in.)	None allowed	None allowed	None allowed	None allowed

[A]Glass thicker than 6.0 mm (¼ in.) and less than or equal to 12.0 mm (½ in.) may contain proportionally more and longer blemishes. Table 4 does not apply to glass thicker than 12.0 mm (½ in.). Allowable blemishes for glass thicker than 12.0 mm (½ in.) shall be determined by agreement between the buyer and the seller.
[B]See 6.1.5 for detection of linear blemishes.

TABLE 4 Blemish Intensity Chart *(continued)*

Detection Distance	Blemish Intensity
Over 3.3 meters (132 in.)	Heavy
3.3 meters (132 in.) to 1.01 meters (40 in.)	Medium
1 meter (39 in.) to 0.2 meters (8 in.)	Light
Less than 0.2 meters (8 in.)	Faint

TABLE 5 Allowable Distortion (Type I Glass) for Cut Size and Stock Sheet Qualities Thickness 6.0 mm (¼ in.) or Less

	Q1	Q2	Q3	Q4
Allowable Vision Interference Angle[A]	≥ 60°	≥ 50°	≥ 35°	≥ 25°

[A]See 6.1 (and Fig. 1) for determining the vision interference angle.

6.1.6 *Blemish Distribution*—In order to determine the separation between blemishes (See Table 2 and Table 4), measure the distance between the two closest points of the blemishes. The minimum separation distance between blemishes is determined by the minimum separation required for the larger of the two blemishes.

6.1.7 *Dimensional Measurements*—To measure the length and width of cut size and stock sheets of flat glass, measure the perpendicular distance from edge to edge, including flares and bevels.

6.1.8 *Squareness Measurement*—After measuring the length and width for compliance with dimensional tolerance, measure the length of both diagonals (corner to corner). The difference in length between the two diagonals (D1–D2) shall not exceed the limits set forth in Table 1.

6.1.9 *Solar/Optical Properties*—If specified, the reflectance and transmittance of glass are to be determined in accordance with NFRC 300.

6.2 *Test Methods For Type II Glass (Wired or Patterned Glass)*:

6.2.1 *Associated Distortion and Blemish Appraisal*—Due to the variety of uses of patterned and wired glass, specific inspection guidelines are beyond the scope of this specification. Check with the manufacturer for more information

6.2.2 *Dimensional Measurements*—to measure the length and width of cut size and stock sheets of flat glass, measure the perpendicular distance from edge to edge, including flares and bevels. Measurements taken at any point must meet the tolerance requirements of Table 7 or Table 8, or both.

6.2.3 *Point Blemish Measurement*—Point blemish size shall be determined by measuring the length and width of the blemish and calculating the average of the two dimensions. The allowable blemish sizes listed in Table 9 do not include associated distortion.

6.2.4 *Solar/Optical Properties*—For patterned and wired glass, check with the manufacturer when the solar and optical properties are required.

6.2.5 *Measuring the Thickness of Patterned Glass*—The thickness of patterned glass shall be determined by measuring high point to high point to the precision and accuracy in Table

TABLE 6 Allowable Shell Chip Size and Distribution (Type I Glass) for Cut Size and Stock Sheet Qualities Thickness 6.0 mm (¼ in.) or Less[A]

Description	Q1	Q2	Q3	Q4
Chip depth	Chip depth ≤ 25 % of glass thickness	Chip depth ≤ 50 % of glass thickness	Chip depth ≤ 50 % of glass thickness	Chip depth ≤ 50 % of glass thickness
Chip width[B]	Chip width ≤ 25 % of glass thickness or 1.6 mm (1⁄16 in.) whichever is greater	Chip width ≤ 50% of glass thickness or 1.6 mm (1⁄16in.) whichever is greater	Chip width ≤ glass thickness or 6 mm (¼ in.) whichever is greater	Not limited
Chip length[B]	Chip length ≤ 2 times the chip width	Chip length ≤ 2 times the chip width	Chip length ≤ 2 times the chip width	Not limited

[A]Glass thicker than 6.0 mm ¼ in. and less than or equal to 12.0 mm (½ in.) may contain proportionally more and larger blemishes. Table 6 does not apply to glass thicker than 12.0 mm (½ in.). Allowable blemishes for glass thicker than 12.0 mm shall be determined by agreement between the buyer and the seller.
[B]Chip width and length are not applicable to stock sheets.

TABLE 7 Thickness and Tolerance for Wired Glass

Designation (mm)	Traditional Designation	Thickness Range mm		Thickness Range mm		Tolerance for Length and Width	
		min	max	min	max	±mm	(±in.)
6.0	¼ in.	6.40	7.60	0.252	0.299	4.8	(3⁄16)
10.0	⅜ in.	8.76	10.03	0.303	0.390	4.8	(3⁄16)

TABLE 8 Thickness and Tolerance for Patterned Glass

Designation (mm)	Traditional Designation	Thickness Range mm		Thickness Range In.		Tolerance for Length and Width	
		min	max	min	max	±mm	(±in.)
2.0	Picture	1.80	2.14	0.071	0.084	1.6	(1⁄16)
2.5	Single	2.15	2.90	0.085	0.114	1.6	(1⁄16)
3.0	Double ⅛ in.	3.00	3.61	0.118	0.142	1.6	(1⁄16)
4.0	5⁄32 in.	3.62	4.37	0.143	0.172	1.6	(1⁄16)
5.0	3⁄16 in.	4.39	5.42	0.173	0.213	1.6	(1⁄16)
5.5	7⁄32 in.	5.43	5.90	0.214	0.232	2.4	(3⁄32)
6.0	¼ in.	5.91	7.60	0.233	0.299	3.2	(⅛)
8.0	5⁄16 in.	7.61	9.10	0.300	0.358	4.0	(5⁄32)
10.0	⅜ in.	9.11	10.70	0.359	0.421	4.8	(3⁄16)
12.00	½ in.	11.50	13.00	0.453	0.512	4.8	(3⁄16)

8, using a measuring device with 19 mm (¾ in.) diameter or greater contact surfaces. As an alternate method, the thickness may be measured using two bars with flat and parallel surfaces 75 mm (3 in.) long or greater × 6 mm (0.25 in.) wide or greater × (0.25 in.) thick or greater.

7. Marking

7.1 Each package of glass shall bear a label, affixed by the manufacturer, giving the manufacturer's name or trademark, nominal thickness, and place of manufacture.

8. Keywords

8.1 architectural glass; flat glass; glazing; patterned glass; tinted glass; transparent glass; wired glass

TABLE 9 Allowable Blemish Size and Distribution for Cut Size and Stock Sheet Patterned Glass[A]

Blemish Size[B,C,D] mm (in.)	Q5 Quality 5	Q6 Quality 6
<2.50 (.10)	Allowed	Allowed
≥2.50 < 4.00 ≥(0.10) < (0.16)	Allowed with a minimum separation of 600 mm (24 in.)	Allowed with a minimum separation of 600 mm (24 in.)
≥4.00 < 6.00 ≥(0.16) < (0.24)	Allowed with a minimum separation of 1200 mm (48 in.)	Allowed with a minimum separation of 1200 mm (48 in.)
≥6.00 < 8.00 ≥(0.24) < (0.31)	Allowed with a minimum separation of 1500 mm (60 in.)	Allowed with a minimum separation of 1500 mm (60 in.)
≥8.00 < 10.00 ≥(0.31) < (0.39)	Allowed with a minimum separation of 1500 mm (60 in.)	Allowed with a minimum separation of 1500 mm (60 in.)
≥10.00 < 15.00 ≥(0.39) < (0.59)	Allowed with a minimum separation of 1500 mm (60 in.)	Allowed with a minimum separation of 1500 mm (60 in.)
≥15.00 <19.00 ≥(0.59) < (0.75)	Not allowed	Allowed with a minimum separation of 1500 mm (60 in.)
>19.00 (0.75)	Not allowed	Not allowed

[A] Glass thicker than 6.00 mm (¼ in.) and less than or equal to 12.00 mm (½ in.) may contain proportionally more and larger blemishes. Table 9 does not apply to glass thicker than 12.00 mm (½ in.). Allowable blemishes for glass thicker than 12.0 mm (½ in.) shall be determined by agreement between the buyer and the seller.
[B] See 6.1.2 for detection of point blemishes.
[C] See 6.2.3 for measurement of point blemishes.
[D] Blemishes not specifically mentioned shall be compared to the blemish they most closely resemble.